## Listing of Claims

The below listing of claims will replace all prior versions of claims in the application.

1. (Currently Amended) A method of estimating timing of at least one of the beginning and the end of a transmitted signal segment in the presence of time delay in a signal transmission channel in an OFDM system, the method comprising:

providing a set of pseudo-random signal m-sequences PN(t;k) (k = 1, ... , K; K ≥1) for which a convolution signal formed from any two sequences satisfies PN(t;i)*PN(t + Δt;j) = δ(Δt)•δ(i,j), where i and j are index numbers identifying the two sequences, t is a time variable, [[δ(Δτ)]] <u>δ(Δt)</u> is a <u>modified</u> delta function <u>with infinitesimal width Δt1 (δ(Δt) = 0 for |Δt| > Δt1)</u> and δ(i,j) = 0 unless i = j;

appending a selected sequence PN(t;k) from the set of pseudo-random signal m-sequences PN(t;k) to at least one signal frame to be transmitted to form a padded signal frame;

transmitting at least one padded signal frame as the transmitted signal through the signal transmission channel in which the transmitted signal may be received with an uncontrollable time delay Δt(delay);

receiving a received signal Rc(t) of the transmitted signal associated with the at least one padded signal frame being transmitted and forming a composite signal, denoted as Rc(t; Δt;comp), given as:

$$Rc(t;\Delta t;comp) = \sum_{k=k1}^{k2} PN(t+\Delta t;k) * Rc(t),$$

where Δt is a selected time increment and k1 and k2 satisfy 1≤ k1≤ k2≤K;

forming a remainder signal, denoted as Rc(t;rem), where Rc(t;rem) = Rc(t) - Rc(t;Δt;comp); and

determining <u>from the remainder signal</u> at least one time at which said selected sequence PN(t;k) (k = k1, k1+1, ... , k2) associated with said at least one padded signal frame begins in the received signal Rc(t).

2. (Previously Presented) The method of claim 1, further comprising determining a carrier frequency associated with said selected sequence PN(t;k) of the at least one padded signal frame being transmitted.

3. (Previously Presented) The method of claim 1, further comprising using at least one of the selected sequences PN(t;k) associated with the padded signal frames being transmitted to estimate at least one parameter associated with said signal transmission channel.

4. (Previously Presented) The method of claim 1, further comprising replacing at least one guard interval associated with at least one of said signal frames to be transmitted with a selected one of the m-sequences PN(t;k).

5. (Previously Presented) The method of claim 1, further comprising using at least one of the selected sequences PN(t;k), associated with one of said padded signal frames being transmitted, to provide time synchronization for said associated padded signal frame.

6. (Currently Amended) A system estimating timing of at least one of the beginning and the end of a received signal in the presence of time delay in a signal transmission channel in an OFDM system, the system comprising a computer that is programmed:

to provide a set of pseudo-random signal m-sequences PN(t;k) ($k = 1, \ldots, K$; $K \geq 1$) for which a convolution signal formed from any two sequences satisfies $PN(t;i)*PN(t+\Delta t;j) = \delta(\Delta t)\bullet\delta(i,j)$, where i and j are index numbers identifying the two sequences, t is a time variable, [$\delta(\Delta\tau)$]] $\underline{\delta(\Delta t)}$ is a <u>modified</u> delta function <u>with infinitesimal width $\Delta t1$ ($\delta(\Delta t) = 0$ for $|\Delta t| > \Delta t1$)</u> and $\delta(i,j) = 0$ unless $i = j$;

to receive at least one padded signal frame Rc(t) transmitted through the signal transmission channel in which the signal being transmitted may be received with an uncontrollable time delay $\Delta t$(delay), where each padded signal frame comprises a signal frame appended to a selected sequence PN(t;k) from the set of pseudo-random signal m-sequences PN(t;k);

to form a composite signal denoted as Rc(t; $\Delta t$;comp) and given as:

$$Rc(t;\Delta t;comp) = \sum_{k=k1}^{k2} PN(t+\Delta t;k) * Rc(t),$$

where $\Delta t$ is a selected time increment and k1 and k2 satisfy $1 \leq k1 \leq k2 \leq K$;

to form a remainder signal denoted as Rc(t;rem) where Rc(t;rem) = Rc(t) - Rc(t;$\Delta t$;comp); and

to determine from the remainder signal at least one time at which said selected sequence PN(t;k) (k = k1, k1+1, ... , k2) associated with said at least one received padded signal frame begins in the received signal Rc(t).

7. (Previously Presented) The system of claim 6, wherein said computer is further programmed to determine a carrier frequency associated with said selected sequence PN(t;k) of the at least one received padded signal frame being transmitted.

8. (Previously Presented) The system of claim 6, wherein said computer is further programmed to use at least one of the sequences PN(t;k) associated with the at least one received padded signal frame to estimate at least one parameter associated with said signal transmission channel.

9. (Previously Presented) The system of claim 6, wherein said computer is further programmed to replace at least one guard interval associated with at least one of said signal frames with a selected one of the m-sequences PN(t;k).

10. (Previously Presented) The system of claim 6, wherein said computer is further programmed to use at least one of the selected sequences PN(t;k), associated with one of said received padded signal frames, to provide time synchronization for said associated padded signal frame.